Title: Device and method for transporting and storing products, in particular bulk goods.

The invention relates to a device for transporting and/or storing products. Such a device is known from practice.

With the known device, use is made of a standard container, for instance a 20 or 40 feet container such as a shipping container. Such containers have a bottom and a roof, sidewalls and a closable loading opening through which products can be brought into and out of the container. A large number of such containers can be loaded in a transport device such as a container ship, for instance in a series of layers on top of each other, so that a high degree of loading can be achieved. Furthermore, the products are well protected by such a container. However, such a container has the drawback that it has fixed outside dimensions, irrespective of the degree of filling. This means that, for instance, upon returning the containers to a filling location, after the goods have been unloaded at a destination, the containers are often completely or for the larger part empty. For filled or empty transport and/or storage, the containers require the same transport space. This is logistically disadvantageous. Moreover, transport and storage of container are often paid to the required volume, which means that the costs for transport and storage of an empty container or a filled container are the same.

It is further known to use substantially flat carriers, such as bolsters or flats on which products can be secured, for instance with the aid of straps or the like. Such carriers are for instance used to transport machines, irregularly shaped products and the like. Then, the bolsters are usually stacked as top layer on a series of layers of standard containers as described hereinabove or carried along as deck load. When using flats, where adjacent the opposite end faces end walls are provided, machines and the like are strapped on the carrier, whereupon the flats can be stacked onto each other as containers. These known methods have as a drawback that, therewith, only relatively

form-retaining products can be transported and stored, while these products are not, at least hardly protected towards the outside. Moreover, the bolsters cannot be stacked one on top of each other.

The invention contemplates a device of the type described in the preamble, wherein the above-mentioned drawbacks have been obviated as much as possible, while maintaining advantages thereof. To that end, a device according to the invention is characterized by the features of claim 1.

With a device according to the invention, two conditions are possible. In a first condition, the block containers are stacked on the substantially plate-shaped carrier, in unfolded and/or set-up condition, while in each block container, products such as bulk goods can be received. As the container is substantially block-shaped, the block containers can be received on the carrier in a relatively dense stacking, such that in this manner, a device is obtained which, as a whole, in the first condition mentioned, is also substantially block-shaped and can be stacked on a comparable device or on standard containers as described in the preamble.

In a second condition of a device according to the invention, the block containers are folded and/or disassembled, so that the volume is considerably reduced, for return or storage of empty block containers. The block containers can then be stacked on the carrier in the folded and/or disassembled condition mentioned, so that the outside dimensions of the respective device in the second condition as a whole are considerably smaller than those of the same device in the first condition. Preferably, a series of devices brought thus in the second condition is stackable, such that, once again, substantially, a block-shape is obtained with outside dimensions which substantially correspond to the outside dimensions of a standard container as described in the preamble, or at least dimensions which fit within a modular size of such a container.

Herein, standard container is at least understood to include a container of the type described in the introduction with dimensions usual in

practice, such as 20 or 40 feet containers. Modular dimensions is at least understood to mean dimensions such that a discrete number of devices according to the invention, in first and/or second condition, stacked next to or on top of each other, have outside dimensions which substantially correspond to the outside dimensions of a standard container. Block container is herein at least understood to include a container, adapted to be folded and/or disassembled, having, substantially, a block shape, i.e. with substantially rectangular sides and a rectangular bottom surface, wherein, optionally, an open top side can be provided through which products can be brought into the block container. A block container can be box-shaped and can be provided with an inner container and an outer container, adapted to be folded and/or disassembled, together or separately.

In a device according to the invention, known bolsters or flats can be used, which have a ground surface which fits within the modular dimensions mentioned and which usually corresponds to the ground surface of a standard container.

In a device according to the invention, block containers are preferably mutually connected, at least in the first condition, in particular in lateral direction. Thus, particularly movements of the block containers in lateral direction can be prevented. During transport, in particular by water, the block containers in loaded condition can normally be sufficiently held on the carrier in vertical direction by their own weight. By lateral blocking, lateral movements can then be prevented. Thus, the block-shape of the device in the first condition and, optionally, in the second condition, is automatically maintained and an even more stable, stackable device is obtained.

Preferably, with a device according to the invention, fastening means are provided on the carrier to which block containers of the or a layer, at least the lower layer, can be attached, whereupon the further block containers of at least the lower layer can be connected to the respective block containers.

Preferably, with block containers according to the invention, coupling means are provided which, in uncoupled position of the block containers are received within the outer contour of the respective block container, while, in coupled condition, they reach partly outside the outer contour mentioned and engage in or on a juxtaposed block container. Then, it is particularly advantageous when the coupling means mentioned can be controlled with the aid of forks of a lifting device, when the block containers are taken up therewith. As a result, the block containers can be positively coupled and/or uncoupled while, thus, damages to in particular the coupling elements and the surroundings can simply be prevented.

The invention further relates to a series of devices according to the invention, characterized by the features of claim 12.

With such an embodiment, the advantage is achieved that a series of devices according to the invention can be transported back and/or stored with a minimal volume, while, furthermore, the devices can be stacked between standard containers and/or devices according to the invention in first, set-up and, optionally, filled condition. Thus, further costs are saved while, furthermore, logistical advantages are achieved.

The invention further relates to an assembly according to the invention, characterized by the features of claims 14 and/or 15.

The invention further relates to a method, characterized by the features of claim 16.

With such a method, block containers with a carrier can be taken up and moved, filled with products, whereupon the same block containers with relatively small volume, in folded and/or disassembled condition can be stored and transported for reuse. Then, in unfolded and/or set-up condition, the separate block containers can have a relatively small volume in relation to the known standard containers. With a method according to the invention, for instance, medium volume bulk transport is made possible, while the required volume for transport of the empty devices is considerably smaller than the

required volume for transport of full devices, so that a considerable saving in volume and costs is obtained. Furthermore, mixed goods, among which relatively small batches of bulk goods, can be transported and stored together in a simple manner, in separate block containers, so that a particularly flexible method is obtained.

In further elaboration, a method according to the invention is further characterized by the features of claim 18.

By assembling the block containers on a carrier to form a block-shaped device with outside dimensions approximately corresponding to those of a standard container, at least fitting within the modular size of such containers, with a method according to the invention, in a particularly advantageous, safe and economical manner, block containers and standard containers can be transported and stored together. Thus, moreover, a particularly large logistic freedom is obtained. Further, both set-up devices, i.e. filled block containers, and standard containers and folded and/or disassembled block containers with carriers can be transported in a mixed manner. Thus, the logistic freedom is even further enhanced.

The invention further relates to the use of a bolster or a flat, characterized by the features of claim 24.

A bolster is a substantially flat carrier, known from practice, with holes for attaching strapping means. A flat is such a bolster which, however, is provided on two opposite ends with a removable or foldable end wall, on which a further flat, bolster or standard container can be stacked. In a use according to the invention, a modular container of standard dimensions is obtained, receivable in a logistic system of bolsters, flats and, in particular, standard containers, while, for transport in empty condition, considerably less space and costs are involved, while a particularly large logistic freedom is obtained. This is particularly so because, in principle, the bolsters and/or flats and/or standard containers for use therewith need not undergo any special modifications.

The invention further relates to a block container, characterized by the features of claim 26.

Such a block container is particularly suitable for use within the invention.

Within the invention, it is preferred that the block containers can be fittingly received in a standard container, in rows included next to or above each other.

In the further subclaims, further advantageous embodiments of a device and method, as well as an assembly and series according to the invention are given. In elucidation of the invention, exemplary embodiments of a device, method, series, assembly and block container according to the invention will be described further with reference to the drawing.

In the drawing:

Fig. 1 schematically shows, in side view, a device according to the invention;

Fig. 2 schematically shows, in side view, a number of stacked devices according to Fig. 1, in set-up condition;

Fig. 3 schematically shows, in side view, a number of devices according to Fig. 1, in folded condition;

Fig. 4 shows, in top plan view, a center part of a carrier according to the invention, provided with a partly shown fastening device;

Fig. 5 schematically shows two devices according to the invention, stacked in an alternative embodiment;

Figs. 6A-B show coupling means for a device according to the invention, in a first embodiment, in retracted condition;

Figs. 7A-B show a coupling device according to Fig. 6, in coupling condition;

Figs. 8A-D show coupling of two block containers according to the invention, with the aid of alternative, schematically shown coupling means;

Figs. 9 - 11 schematically show a block container for use within the invention;

Fig. 12 schematically shows a logistic method according to the invention; and

Fig. 13 shows a second alternative embodiment of coupling means for use within the invention.

In this description a block container is understood to include a container adapted to be at least partly folded and/or disassembled, having at least in unfolded condition, substantially, a block-shape, i.e. substantially rectangular end faces, side surfaces and bottom surface. Block containers for use within the invention have dimensions which fit within a modular system based on standard containers. Such standard containers, for instance shipping containers, are generally indicated as, for instance, 20 feet or 40 feet containers. Such standard containers are generally used for transport by, for instance, water, road or train and for storage. A block container according to the invention can, for instance, be designed as shown in Fig. 9, but can also be designed in a different manner, for instance as a crate that can be folded or be disassembled, or the like. Specific embodiments, to which the invention is not limited, are shown in the non-prepublished Dutch patent application entitled "Method and device for packaging cocoa beans and such natural products", filed on November 15, 2000. This patent application is deemed to be incorporated herein by reference. In this description, reference will be made to the use of bolsters and flats. Such carriers are known from practice.

Fig. 1 schematically shows, in side view, a device 1 according to the invention in a first embodiment, wherein on a bolster 2 as carrier, two layers of block containers 4 are received, of which, in the exemplary embodiment shown, eight end face walls 6 are visible. Viewed in side view, in the center of the bolster 2, a fastening element 8 to be further described has been fitted, which extends approximately over the width of the bolster 2. On both sides of the fastening element 8, the block containers 4 have been arranged. The bolster 2

has a length L of, for instance, 20 or 40 feet, while the block containers, in the longitudinal direction L of the bolster 2, have a width B which is chosen such that a discrete number of block containers, in the shown exemplary embodiment four block containers 4, together with a fastening element 8 received therebetween can be fittingly received on the bolster 2. This means that the block containers 4 are pushed against each other by the longitudinal sides 10, on both sides of the fastening element 8, the outer side walls 10A being approximately, preferably exactly, flush with the end faces 12 of the bolster 2. In a comparable manner, the end walls 6 are flush with the longitudinal edges 14 of the bolster 2, as shown in Fig. 4 in which one block container 4 has been schematically drawn in. The block containers have been stacked directly on top of each other, such that they engage in each other partly, while the bolster 2 and the two layers of block containers 4 stacked thereon have a height corresponding to the height of a standard container. In this manner, a device 1 is obtained having the same outside dimensions as a standard container. The load bearing capacity of the bolster 2 and the block containers 4 stacked thereon is chosen such that a series of devices 1 can be stacked in the same manner as with standard containers, for instance up to seven or eleven layers, while, each time, a bolster 2 rests on the upper sides 16 of the upper layer of block containers 4. Such a stacking is schematically shown in side view in Fig. 2.

Fig. 2 shows eight devices 1 stacked in two rows of four layers. Here, again, each device comprises two layers of block containers 4, as shown in Fig. 1. This means that eight bolsters 2 with 64 block containers 4 are stacked in a space corresponding to the space required for stacking eight standard containers. In Fig. 2, all block containers are shown in unfolded condition, which containers are filled with products, such as, for instance, bulk goods. By way of illustration, block containers 4 according to the invention can for instance be filled with natural products, such as cocoa beans, coffee beans or the like, with granulates, grains and the like, but also with more solid

products, such as products packaged in boxes. However, this should not be taken to be limitative in any way. The block containers 4 can also be used for different products, stacked on one and the same bolster.

In Fig. 3, the devices 1 of Fig. 2 are shown in folded condition. This means that the block containers have been folded and put on the respective bolsters 2, whereupon these have been stacked one on top of the other. Then, the height H of the eight devices 1, in folded condition, is preferably equal to the height H of one device 1 in unfolded condition, i.e. of a bolster having thereon two layers of block containers 4. It will be clear that by suitable dimensioning, it is, for instance, also possible to fold together and stack a different number, for instance eleven, devices 1, as shown in Fig. 3 within a height H corresponding to the height of a device 1 in unfolded condition. As is clearly found upon comparison of Figs. 2 and 3, by folding and stacking the devices 1, a particularly large space saving is obtained. This means that for returning and storing the empty block containers 4, at least devices 1, little space is required, which, naturally, is economically advantageous.

Fig. 4 schematically shows, in top plan view, a bolster 2 having thereon one block container 4, which abuts against a beam-shaped fastening element 8 extending over the width of the bolster 2. In Fig. 4, only half the fastening element 8 is shown, so that keyholes 16 situated underneath are visible. Such keyholes 16 are usually provided in bolsters. At the bottom side, the fastening element 8 is provided with pins with flanges with which the fastening element 8 can be secured in the keyholes 16. However, it will be clear that the fastening element 8 can be secured in any desired manner. Optionally, it can even form an integral part of the bolster 2.

In Fig. 5, two devices 1 according to the invention are shown, stacked, in an alternative embodiment. In this embodiment, eight block containers 4 have been stacked on a flat 2A. Such a flat 2A, known from practice, is in principle comparable to a bolster 2 as shown in Figs. 1 – 4, while, however, two diametrically opposed end walls 18 are provided, connected in

hinges 20 to a plate-shaped carrier 2B, designed as a bolster 2. The end walls 18 have a height such, that, again, the height H of the device 1 is equal to the height of a standard container. The eight block containers 4 are stacked in dense stacking on the carrier 2B between the end walls 18, such, that the entire device 1, again, is substantially block-shaped. The devices 1 are stacked by placing the carrier 2B of the upper device 1 on the end walls 18 and/or the block containers 4. Once again, when the block containers 4 are empty, the block containers 4 can be folded and/or disassembled, by pivoting the end walls 18 against the carriers 2B. Subsequently, the folded or disassembled block containers 4 are stacked on the side walls 18, whereupon, once again, the thus folded devices 1 can be stacked as shown in Fig. 3.

It will be clear that the bolsters 2 and the flats 2A can also be used together in random combinations, optionally together with standard containers of the same, at least a matching modular size. Also, the bolsters 2 and the flats 2A can be stacked directly one on top of the other, while, for instance, the block containers 4 are stacked and transported separately, while, for instance, they can also be stored in a standard container. In particular, this is preferred when loose parts, such as bigbags which are to be suspended in frames of the block containers 4 or the like, are to be taken along.

In the exemplary embodiments shown, each time, eight block containers 4 are stacked on a bolster 2 or flat 2A. However, it will be clear that also a different number of block containers 4 can be stacked thereon, by modifying the outside dimensions of the block containers 4 or by using a bolster 2 or flat 2A with different standard dimensions. Also, the block containers 4 can be stacked in a different number of layers, depending, again, on the outside dimensions of the block containers on the one hand and the standard containers, at least the desired outside dimensions of the device 1, on the other hand. Such modifications will be directly clear to the skilled person.

In devices 1 according to the invention, the block containers 4, at least in set-up and/or unfolded condition and preferably also in folded

condition, are mutually connected, while, furthermore, at least one and preferably a number of the block containers are connected to the bolster 2 or flat 2A at least the carrier 2 via the fastening means 8. To this end, any fastening means known from practice can be used, among which, for instance, straps, clamping connections and the like. However, it is preferred that coupling means be used which form part of the block container 4 and/or the fastening means 8 and which, in non-coupled condition, are completely received within the outer contours of the block containers 4 and only in coupled condition reach beyond them, for engagement of an adjacent block container and/or fastening means 8. In Figs. 6 – 8, two exemplary embodiments of such coupling means are shown by way of illustration. An advantage of such coupling means is that they are always available, while damage to them is easily prevented when the block containers 4 are not coupled. The fact is that then, the coupling means are fully protected towards the outside.

In Figs. 9 – 11, an embodiment of a foldable block container 1 is shown, as an example, with reference to which coupling means according to Figs. 6 – 8 will be described.

In Fig. 9, in side view, an embodiment of a frame 102 for a block container 4 according to the invention is schematically shown. In this schematic view, at the left hand side, a frame wall part 132 in set-up condition is shown and at the right hand side in collapsed condition. In Fig. 10, in perspective view, a lower corner of a frame according to Fig. 9 is shown, viewed from the inside. The frame 102 comprises two longitudinal girders 126 extending parallel to each other and two cross girders 126A mutually connecting the longitudinal girders by their end faces. The girders are manufactured from box profiles. In the longitudinal girders 126, adjacent the end faces, on both sides, rectangular recesses 182 are arranged, adjacent the lower sides. The frame wall parts 132 comprise two legs 134 extending parallel to each other, connected at the top end by a cross connection 136, while,

adjacent the lower ends, the legs are provided with a leg part 180 extending, with the frame wall part 132 in set up condition, approximately horizontally and parallel to the longitudinal girders 126. Adjacent the free end of the leg part 180, a blocking pin 148 is provided which reaches into the rectangular recess 182 and has relatively much clearance there. Adjacent a lower end, the two legs 134 are mutually connected by a cross rod 149, having, for instance, a circular cross section. This cross rod 149 extends parallel to the cross girders 126A, adjacent an upper side thereof. On the upper side of the cross girders 126A, a number of hooking elements 147 have been fitted, for instance by welding, open at the top and turned outwards. With a set-up frame wall part 132, as shown in Fig. 9 at the left hand side, Fig. 10 and Fig. 11A, the cross rod 149 is received within the hooking elements 147. A sack-shaped element 104 can be attached to hooking elements 154, 156. When loaded by the sack-shaped element, the frame wall part 132 is loaded in the direction F, so that, in principle, it will tend to rotate about the cross rod 149, within the hooking element 147, the horizontal leg part 180 being pushed against a horizontal plate part 140 welded between the frame parts 126, 126A, while the blocking pin 148 is pushed into a lower corner of the recess 182 proximal to the cross girder 126A. The lower end of the legs 134 is then pushed against the cross girder 126A. In this condition, the frame wall part 132 is securely locked and the packaging device 101 can be manipulated in a simple manner and, for instance, be held upside down to be emptied. Moreover, on the plate part 140, a locking projection 181 is provided, against which the free end of the leg part 180 abuts. As a result, the leg 134 cannot rotate without it first being slightly lifted, whereupon the hook 147 will deform elastically at least to some extent, as will be discussed further.

In Fig. 9 on the right hand side, the frame wall part 132 has been brought in a collapsed condition. With reference to Figs. 11 A-D, this will be explained further.

From the set-up position, as shown in Fig. 11A, where a lower corner of the frame 102 is shown, a sack-shaped element 104, suspended within the frame 102, is taken from the hooks 154, 156 after it has been emptied. Then, the frame wall part 132 is lifted up somewhat, until the leg part 180 reaches above the locking projection 181, whereupon it is tilted outwards in the direction T facing away from the arrow F in Fig. 9, about the cross rod 149 within the hook-shaped elements 147, such, that the blocking pin 148 is pushed into a top corner of the recess 182 remote from the cross girder 126A. When the frame wall part 132 is moved upwards, the hook-shaped elements 147 and/or the cross rod 149 are elastically deformed to some extent to enable the desired placement. Due to the position of the blocking pin 148, further rotation is prevented. This position is shown in Fig. 11B. From this position, the frame wall part 132 is pulled upwards, approximately parallel to the plane of the frame wall part 132, such that the cross rod 149 is pulled from the hook-shaped elements 147. Preferably, here, a slight elastic deformation should occur, so that a proper confinement can be obtained. In Fig. 11C, the cross rod 149 is shown detached from the hook-shaped elements 147, while the frame wall part is somewhat moved upwards in relation to the position as shown in Fig. 11A, such, that the blocking pin 148 is pushed in the upper corner of the recess 182 proximal to the cross girder 126A. Then, the frame wall part 132 is tilted in the direction F, to the position shown in Fig. 11D, while the legs 134 extend parallel to the longitudinal girders 126, the leg part 180 extending approximately vertically and resting on the plate 140. Then, the blocking pin 148 lies at the bottom of the recess 182.

The block container described here is described in more detail in the above-mentioned Dutch patent application, which is incorporated herein by reference, also as regards the further embodiments described therein.

It will be directly clear that a frame wall part 132 can be brought from the position shown in Fig. 11D to the position shown in Fig. 11a in a simple manner, in an order contrary to the earlier described order for folding

in. In the embodiments shown, the sack-shaped element can, for instance, be simply designed as a big bag. Preferably, a block container 4 according to the invention has a modular size fitting standard (shipping) containers, for instance (x*0.5)m x (y*0.6)m x (z*0.6)m, where x, y and z are integers.

The frame can be designed in many different manners, for instance such that it can be wholly or partly disassembled instead of being folded. Also, different types of sack-shaped elements can be used. Further, for instance, more than two frame wall parts can be provided, so that several sack-shaped elements can be suspended in a block container according to the invention while frame wall parts can also be built up differently, for instance from wire netting, perforated or closed plate material or the like.

It is noted, for that matter, that in the foregoing Figures, reference numerals from the Figs. 9 – 11 are indicated without further discussion, by way of illustration.

In Figs. 6A and 6B, in front view and side view, respectively, two girders 126 are shown, pushed against each other and having, connected thereto, cross girders 126A and legs 134. In Fig. 6, they are drawn in uncoupled condition. Figs. 7A and B show the same views, but in coupled condition. In Figs. 6A and 7A, in the left hand girder 126, coupling means 200 are shown. These coupling means comprise a shaft 202 extending approximately horizontally having thereon a first run-on cam 204, fixedly connected to the shaft 202. A second run-on cam 206 is rotatably disposed on the same shaft 202. The run-on cams 204, 206 have complementary, inclining surfaces, which include an angle α with the longitudinal axis L of the shaft 202. Between the second run-on cam 206 and the outwards facing wall 208 of the girder 126, a spring 210 is included, which pushes the second run-on cam 206 with the inclining surface against the first run-on cam 204. On the second run-on cam 206, on the side proximal to the wall 208, a somewhat U-shaped bracket 212 is fitted, with a long leg 214 abutting against the second run-on cam 206, and a relatively short leg 215 located adjacent the wall 208, below

the shaft 202. In the wall 208, under the shaft 202, an opening 216 is provided, through which the relatively elongated, U-shaped bracket 212 can reach, at least through the short leg 215 thereof. As is clear from Figs. 6A and B, in the first position shown there, the U-shaped bracket 212 is virtually completely received within the box profile 126, while an inclining striking lip 218 reaches into the opening 216 to some extent. To the long leg 214, an arm 220 is attached, which, in the first position, extends approximately horizontally in the direction facing away from the U-shaped bracket 212, while against the inner side of the wall 208, approximately adjacent the lower longitudinal edge of the opening 216, at a distance from the opening 216 mentioned, a pin 222 extends, on the inside of the girder 126. This pin 222 has a length which is smaller than the distance between the second run-on cam 206 and the wall 208. In the girder 126 shown in Figs. 6A and 7A at the right hand side, a corresponding opening 216A is provided, in which no further coupling means have been provided. The coupling means 200 can be used as follows.

After two block containers 4 have been fittingly pushed against each other, such that the openings 216, 216A abut against each other, the U-shaped bracket 212 is pushed over the lower longitudinal edge 217 of the opening 216, through the opening 216 and 216A, whereupon the second run-on cam 206 is rotated about the shaft 202, counter-clockwise in the side views of Figs. 6B and 7B. The second run-on cam 206 is then forced outwards by the first run-on cam 204, while compressing the spring 210. The free end 224 of the short leg 215 of the U-shaped section 212 will then engage against the inner side of the wall 208A of the right hand box profile 126, above the opening 216A, while the arm 220 is forced beyond the pin 222 and will engage behind it. In this condition, the coupling means 200 are blocked by the arm 220 and the pin 222, while the two profiles 126 are held against each other by the U-shaped bracket 212. Upon uncoupling of the two block containers, the arm 220 is again forced along the pin 222 in a simple manner so that the U-shaped bracket 212 is forced back into the first position by the spring 210, as is shown in Figs. 6A and 6B.

Also, when next to the left hand block container 4 no second block container 4 extends, at least not with an opening 216A at the suitable position, the U-shaped section 212 will be forced back into the box profile 126 by the spring 210. Lateral connection of the block containers 4 offers the advantage that moving apart of the block containers 4 on the bolsters 2 and/or the flats 2A is prevented. Thus, a particularly stable stacking can be obtained.

In the fastening means 8, designed in Fig. 4 as a box profile 8, openings 216A are provided, in which the coupling means 200, at least the U-shaped sections can engage, so that the block container 4 can be attached to the fastening means 8. Thus a secure confinement is effected.

In Figs. 8A-C, an alternative embodiment of coupling means 200 according to the invention is shown, in a girder 126. In Fig. 8A, in cross section, a girder 126 is shown, in which an arm 232, pivotable about a shaft 230, is fitted. The arm 232 reaches from the shaft 230 through an opening in the inward facing wall 208B through the box profile 126 into an opening 216 provided in the opposite wall 208. The arm 232 is provided at its free end with a hook 234 which is turned upwards. Between the bottom wall 209 of the girder 126 and the arm 232, a spring 210 is provided, which biases the arm 232 in an upwardly pivoted position, as shown in Fig. 8A. There, the arm 232 has a length such that in the upwardly pivoted position shown in Fig. 8, it is virtually completely received within the box profile 126. From this position, the arm 232 can be pivoted downwards, to the position shown in Fig. 8B, while compressing the spring 210, such that the hook 234 reaches outside the opening 216. In this condition, the hook 234 can be inserted through an opening 216A into a girder 126A of a block container 4A to be coupled. This opening 216A has a height D which is considerably less than the height of the box profile 126. The upper longitudinal edge 217 of the opening 216A is, for instance, at approximately the same height as the shaft 230. When the girders 126, 126A are pushed against each other, as shown in Fig. 8C, the arm 232 can be released, whereupon it is pivoted upwards by the spring 210, in the

direction of the first position shown in Fig. 8A. However, then, the hook 234 will engage behind the wall 208A of the right hand box profile 126A, behind the upper longitudinal edge 217 of the opening 216A. Thus, in a simple manner, further pivoting is prevented, while the two box profiles 126, 126A are mutually coupled. If no box profile 126A is pushed against the left hand box profile 126, the arm 232 will move on to the first position, back into the box profile 126. When the right hand block container 4A is lifted, the hook 234 will automatically be released from the opening 216A, such that the block containers 4, 4A are uncoupled.

It is preferred that the coupling means 200 can be operated by, for instance, forks of a forklift truck with which the block containers 4 are lifted. In the embodiment shown in Fig. 8, this can for instance be effected by lengthening the pivot arm 232 in the direction facing away from the opening 216, for instance with an arm 232A, extending approximately horizontally, represented in Fig. 8A in dotted lines. In the opposite girder 126 of the same block container 4 (not shown) openings are provided through which both forks of a forklift truck can be inserted, for lifting the block container 4. Then, the forks are slid under the lengthened arm 232A, which arm is then pushed away upwards. Thus, the pivot arm 232 is forced downwards, to the position shown in Fig. 8B. When the forks are retracted, the pivot arm will be forced back by the spring 210 in the direction of the first position shown in Fig. 8A. This means that when the block container 4 shown at the right hand side in Figs. 8C and 8D is removed with a forklift truck, the arm 232 is forced downwards again and the block container 4 can be taken away.

The coupling means 200 can also engage over the girders 126, for instance as a substantially L-shaped bracket 242, shown in Fig. 13, pivotable about an axis 240 extending parallel to the girder 126, which bracket 242, in an uncoupled condition, rests on a girder 126, with the leg 244 of the L upwards, and, in coupled condition, engages over an adjacent girder 126, with the leg of the L downwards. Preferably, then, the bracket 242 is biased by a

spring 246 in the uncoupled and/or in the coupled condition, with the aid of a snap mechanism having two dead centers. To that end, for instance, the spring 246 can be used as shown in Fig. 13.

Fig. 12 schematically represents how devices 1 according to the invention can be used. A number of frames 102, in folded condition as partly represented in Fig. 3, preferably stacked on a bolster 2 or flat 2A, are transported to a filling location, such as a plantation 72, together with a matching number of sacks 104, represented in folded condition. Since, as a result, the devices 1 take up a relatively small volume, a large number of such devices can be transported in a simple manner. At the plantation mentioned, at least at a suitable filling location, the devices 1 are set up by folding out the frames 102 and suspending the sacks 104. Then, the sacks 104 are filled with cocoa beans from the plantation 72, whereupon the devices 1 are transported, in stacked condition, to a storage space and/or processing device 74, where the devices 1 are arranged integrally in a storage space 74, for instance with a forklift truck. To that end, the devices can be restacked, but can also be placed in racks on rollers or the like, so that moving is possible in a simple manner. As the sacks 104 are air-permeable and do not entirely abut each other as a consequence of the frames 102, during transport and storage ventilation of the cocoa beans can be ensured in a simple manner, so that mold formation, rotting and the like can simply be prevented. As the devices can simply be taken up and moved in their entirety, each time a suitable choice from the cocoa beans present can be made for further processing. If a particular block container 4, at least the cocoa beans present therein are eligible for further processing, the block container is simply taken up, for instance with a suitable forklift truck or the like, whereupon it can be driven to a pouring place. There, the block container 4 is tilted, preferably to a position wherein the open upper side 106 is substantially directed downwards.

It is preferred that use is made of a calculating unit with which, each time, the amount of devices 1, at least frames 102 and sacks 104 can be

calculated which have to be transported to a particular plantation 72, at least collecting point for packaging the cocoa beans or such products available there. Naturally, for other types of products, modified block containers, filling locations and methods for loading and unloading can be used. Thus, a particularly simple and economically logistic system is obtained.

The invention is not limited in any way to the exemplary embodiments described and shown in the drawings. Many variations thereon are possible within the framework of the invention as outlined by the claims.

For instance, other types and other numbers of block containers can be used within the invention, while combinations of bolsters, flats and standard containers can be used. The coupling means 200 can be designed in a different manner, while, furthermore, if applicable, they can be omitted when the block containers can be placed loosely, or can be secured in a different manner, for instance by strapping, or can be connected with other coupling means.

In the description, a logistic system is described on the basis of transport and storage, as well as use of devices 1 according to the invention for cocoa beans. However, it will be clear that in the same or in a comparable manner, devices according to the invention can also be used for different products, to be poured or not to be poured in bulk. For the coupling means 200, also other operating means can be provided, for instance biased such that they are coupled upon placement of the block containers on each other and/or on a bolster, while, upon lifting thereof, the coupling means will be automatically released. It will be clear that the block containers 4 as a result of their own weight and, optionally, further block containers and/or devices according to the invention placed thereon will be held in their place in vertical direction.

Instead of bolsters 2 and/or flats 2A known per se, also different, substantially plate-shaped carriers can be used, for instance custom made carriers. The devices 1 according to the invention can be stacked both in

storage places and in transport means. The block containers 4 can be fastened to the carrier 2 in a different manner, for instance directly in the keyholes.

These and many comparable variations are understood to fall within the framework of the invention as outlined by the claims.

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